journal

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THAN A BOMB

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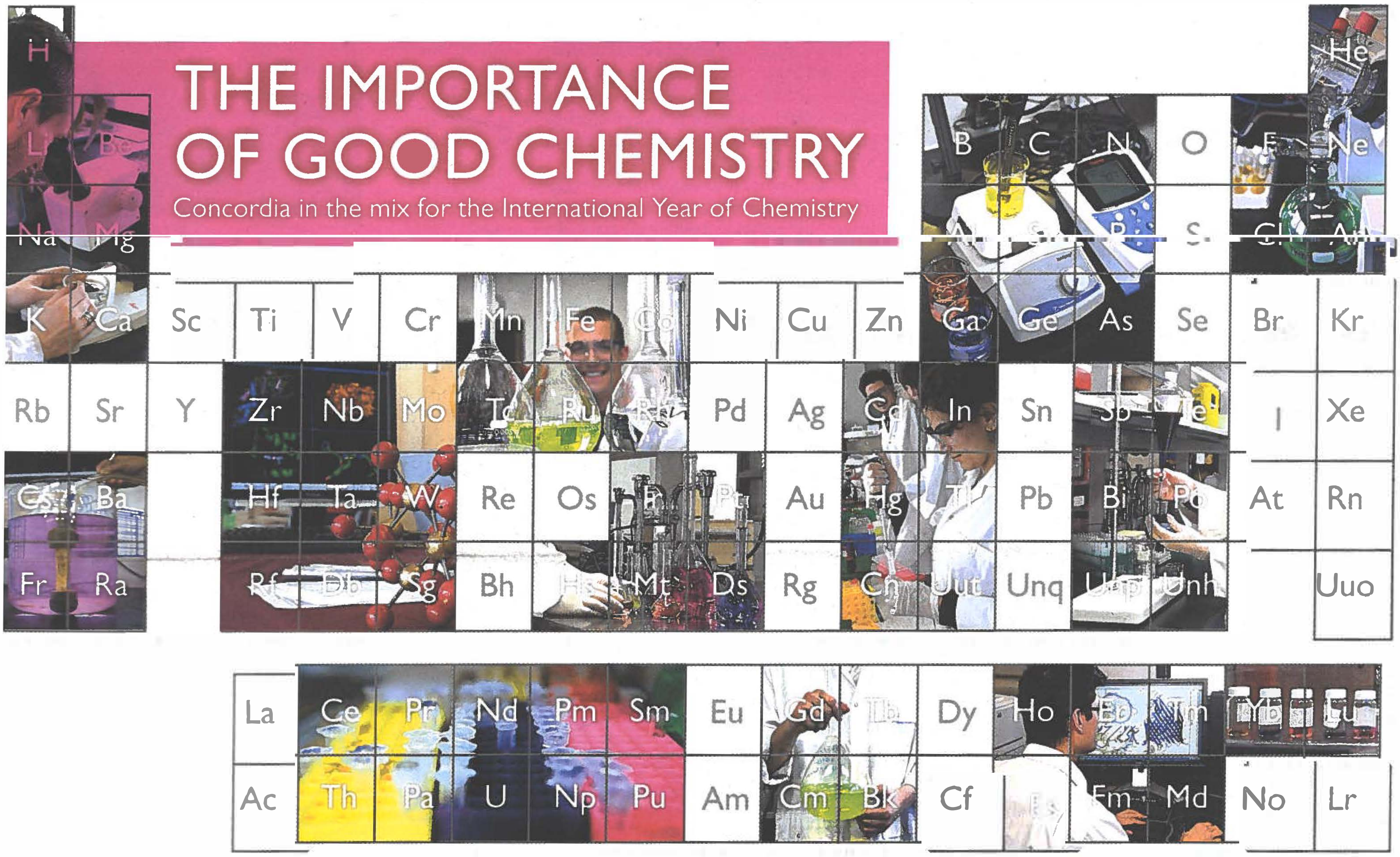
GOOD
VIBRATIONS?

THE IMPORTANCE OF GOOD CHEMISTRY

Concordia in the mix for the International Year of Chemistry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CHRISTINE ZEINDLER

"From making bread to ironing a cotton T-shirt, many of life's simple routines can be explained through chemistry," says Rafik Naccache, a doctoral student in Concordia's Department of Chemistry and Biochemistry.

With the launch of the International Year of Chemistry, designated by UNESCO (United Nations Educational, Scientific and Cultural Organization), it seemed timely to ask a number of Concordia chemists to share their insights.

"The old slogan of 'better living through chemistry' applies more today than ever," says John Capobianco, Concordia University Research Chair in Nanoscience (Tier 1). "There is chemistry all around us, including those items we take for granted, such as our shampoo or our CDs."

SPOTLIGHT ON CANCER THERAPY

As a nanochemist, Capobianco is exploring how to use nanoparticles to detect, image and treat cancers through the use of light. The first step in the process is to bind nanoparticles to the cancer cell.

"Once bound, we can see the cancer cell by probing the nanoparticles with a laser, which will generate a visible light signal," he explains. "The next step is to use this light to activate a photodynamic drug – to kill the cell."

Although trained as an inorganic chemist, a branch of chemistry concerned with the properties and behaviour of compounds not containing carbon, much of Capobianco's research combines chemistry and biology.

14 CONCORDIA RESEARCH AREAS FROM ANALYTICAL TO THEORETICAL CHEMISTRY.

According to Joanne Turnbull, chair of the Department of Chemistry and Biochemistry, one of the most interesting developments in the last two decades is the emergence of new approaches and techniques that allow chemistry to interface with biology. "We are now really seeing where we can broaden the applications of chemistry," she says.

The department focuses on the structure of substances and their reactions, as well as those events that occur in living cells. Although traditional subdivisions including physical and inorganic chemistry are included in the hierarchy, new interdisciplinary subdivisions have emerged, including bioinorganic chemistry and nanochemistry.

ANTIMICROBIALS – A BURGEONING FIELD

New antimicrobial therapies studied in the laboratory of Christine DeWolf demonstrate the potential benefits of combining chemical and biological knowledge. DeWolf, an associate professor who specializes in surface chemistry, examines lipid (or fat) organization in biological membranes, such as those surrounding bacteria cells. Her team studies how small peptides (short chains of amino acids) can target and disrupt these membranes and thereby kill harmful cells.

"Drug resistance is on the rise and becoming a major problem," she says. "We are therefore trying to target a whole new class of antibiotics that act differently. We are hopeful that the bacteria will not be able to develop resistance as quickly."

ON TARGET BY MANIPULATING DNA

Drug resistance of a different nature is the focus of Christopher Wilds, a bioorganic chemist and Canada Research Chair in Biological Chemistry.

CONTINUED ON P. 3

EXTERNAL GOVERNANCE REVIEW COMMITTEE ESTABLISHED

Three-person committee will review composition, roles and function of Concordia's governing bodies

Concordia University has established an External Governance Review Committee and confirmed its membership and mandate. The creation of the committee stems from an initiative by the Concordia Senate and Board of Governors.

The committee will make recommendations on the appropriate compositions, selection procedures, mandates and roles of formally constituted governing bodies at Concordia and prepare a public report within 60 days.

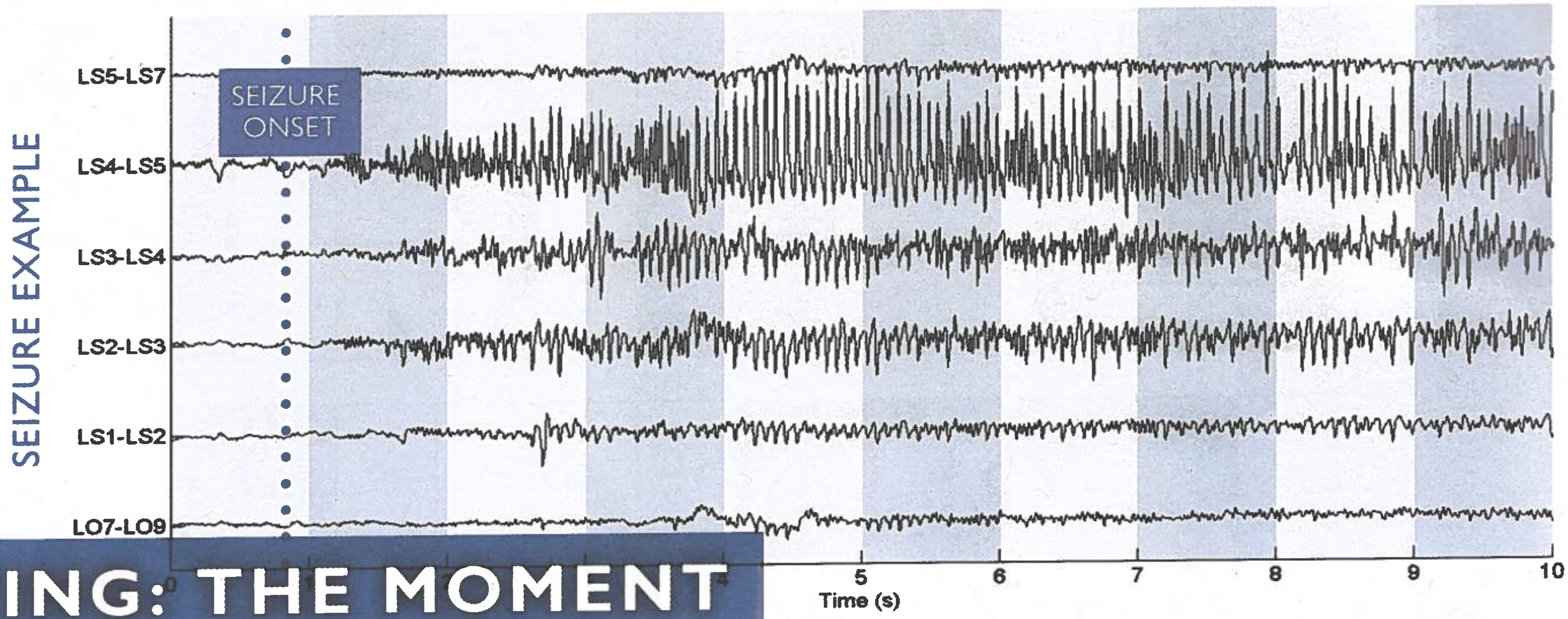
Bernard Shapiro, former Principal and Vice-Chancellor of McGill University and Canada's first Ethics Commissioner has been named chair of the committee. The two other members of the committee are André C. Côté, who served as Quebec's first Lobbyists Commissioner and was formerly dean of the faculty of law and then Secretary General at Université Laval; and Glen A. Jones, Associate Dean Academic and Ontario Research Chair on Postsecondary Education Policy and Measurement at the Ontario Institute for Studies in Education at the University of Toronto.

"These distinguished individuals possess a wealth of knowledge and experience in the administration of universities and related governance issues," said President Fred Lowy. "In an effort to be as open and inclusive as possible, I invite all members of Concordia to take this opportunity to make written submissions to the committee."

Anyone wishing to make a written submission must notify Danielle Tessier (*danielle.tessier@concordia.ca* or fax 514-848-4550) before April 1, 2011 and submit the material before April 15, 2011.

To learn more about the committee's mandate and members, go to *http://concordia.ca/board-and-senate/egrc.*

Bernard Shapiro will lead the committee tasked with reviewing governance practices at Concordia University. | COURTESY MCGILL UNIVERSITY



In this image of an EEG scan supplied by Rajeev Agarwal, the onset of the seizure is visibly evident across several channels.

SEIZING: THE MOMENT

Concordia researchers open new window on brain activity with unique approach to seizure detection

CHRIS ATACK

Researchers at Concordia University have pioneered a computer-based method of detecting epileptic seizures – a method which may open new windows on the brain's electrical activity. Their research paper, "A Novel Morphology-Based Classifier for Automatic Detection of Epileptic Seizures," presented at the annual meeting of the Engineering in Medicine and Biology Society, documents the very successful application of this new method of seizure detection.

An epileptic seizure – caused by disruptions in the normal electrical activity of the brain – can produce a range of symptoms including convulsions and unconsciousness. To learn more about the timing and nature of seizures, the electrical activity of patients' brains is often recorded using electroencephalograms (EEGs). At the moment, however, epilepsy experts must review these recordings manually – a time-consuming process.

"EEG recordings may cover a period of several weeks," explains study co-author Rajeev Agarwal, a professor in Concordia's Department of Electrical and Computer Engineering. "That's a lot of data to review. Automating the process is difficult, because there's no exact definition for a seizure, so there's no template to look for. Every seizure is different with every patient."

However, seizures have certain recognizable characteristics. They occur when neurons fire in a synchronous or rhythmic manner. As seizures progress, the EEG signals have very strong transitions. Seen on an EEG recording, the waves of electrical activity tend to spike, rather than curve. Knowing this, the Concordia team, led by PhD candidate and lead study author Rajeev Yadav, devised an algorithm to check the "sharpness" of the electrical signals on the EEG recordings as measured by their angle or slope. A series of sharp signals indicates a seizure.

This approach proved extremely successful. In the study of EEG recordings of seven patients, the new method detected every seizure while scoring an extremely low rate of false positives. Results are far better than those obtained with existing methods.

This approach to detecting seizures may have applications beyond epilepsy. "Patterns of sharp electrical activity in the brain are generally not a good thing," says Agarwal. "Think of comatose patients in the ICU for example. Some of them may be having seizures or epileptic form activity – but there's no way to know at the moment. Our method may allow health professionals to gain a much clearer picture of patients' brain function."

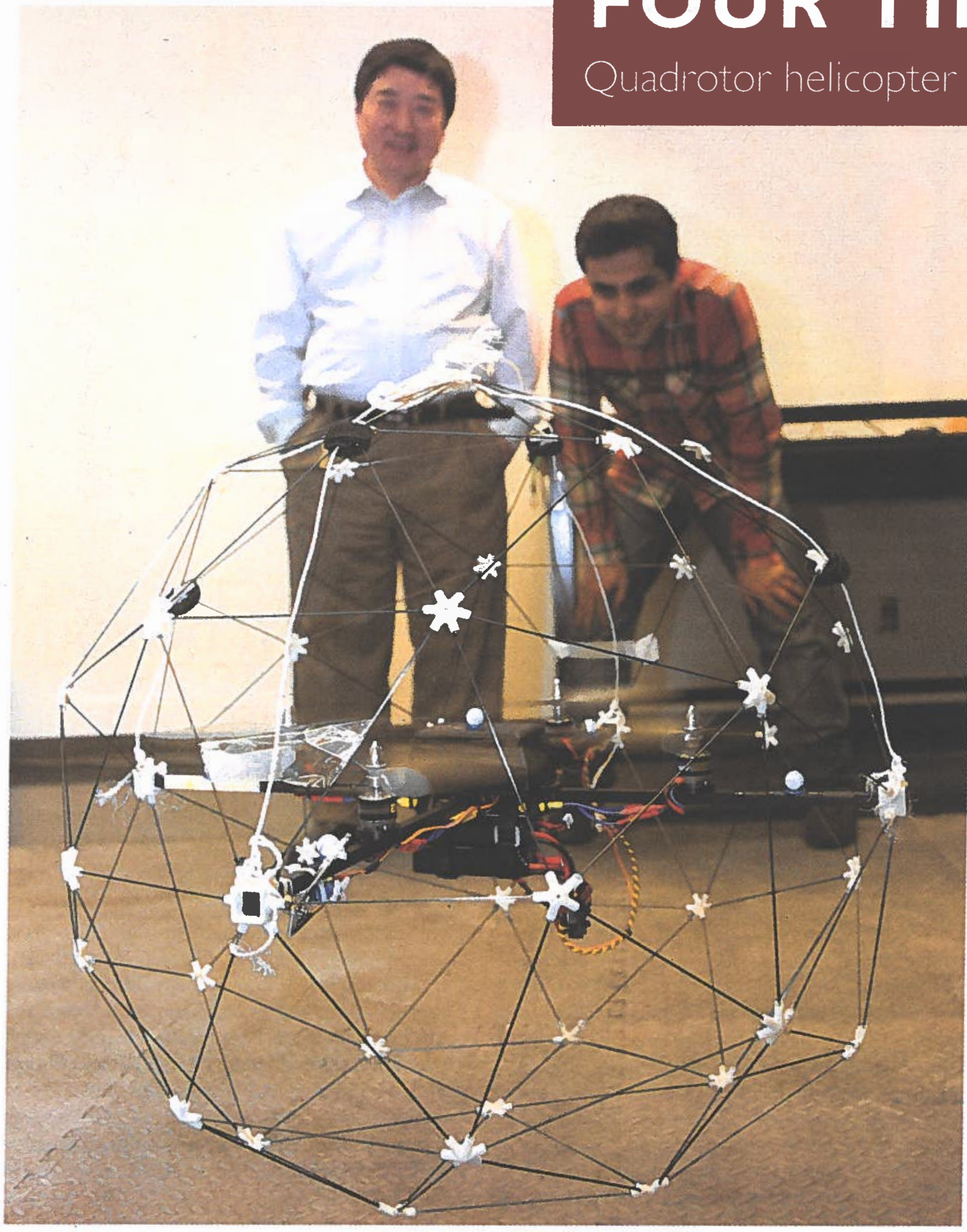
Concordia researchers are continuing to evaluate and refine this method of seizure detection. More patient data from several different centres is being reviewed, and further publications on the subject are planned. So far, according to Agarwal, results are promising.

OUR METHOD MAY ALLOW HEALTH PROFESSIONALS TO GAIN A MUCH CLEARER PICTURE OF PATIENTS' BRAIN FUNCTION.

RAJEEV AGARWAL

FOUR TIMES THE FUN

Quadrotor helicopter used in classroom is a first worldwide



Professor Youmin Zhang and second-year Mechanical and Industrial Engineering PhD student Iman Sadeghzadeh (right) demonstrate the Qball in their 12th-floor EV Building lab. This type of technology "is not just my career at university. It's my passion as well," says Sadeghzadeh. | CONCORDIA UNIVERSITY

RUSS COOPER

The first day of the class, there were students who couldn't believe their eyes. Many even broke out their phones to capture video for friends who probably wouldn't imagine something so cool.

For the Mechanical and Industrial Engineering students, this was heaven.

That's because for the first time anywhere, the Quanser Qball-X4 – a 1.4-kilogram quadrotor helicopter with four 25-centimetre propellers protected by a one-metre diameter, 80-sided (octacontagon) carbon fibre cage – is being used as a teaching tool.

In fact, this is the first time any quadrotor unmanned aerial vehicle (UAV) is being used in the classroom.

"The purpose of the class, MECH 480/6091 - Flight Control Systems, is to teach students the concept of flight and flight dynamics, as well as how to design an autopilot," says Mechanical and Industrial Engineering professor Youmin Zhang, who teaches the undergraduate course.

The course itself is also pretty cool not only for its content, but for its breadth of student appeal. It welcomes third- and fourth-year undergraduates, and graduate students up to the doctoral level who are taking the course to boost their expertise.

The five Qballs Concordia bought last fall give the class's 35 students a unique opportunity to develop automatic flight control functions for UAVs and to test them safely in a special teaching lab in the Henry F. Hall Building.

Students aren't learning to control the quadrotor with a joystick. Rather, they develop algorithms that guide the helicopter along a preset path.

To gauge the Qball's accuracy along its flight, the lab has six cameras capturing locations along *x*, *y*, and *z* axes. The data, complete with recordings of deviations due to environmental disturbances or formula flaws, is then compared with the original established path.

Zhang is convinced that the knowledge and experience students gain could give them an edge in the aeronautics industry; knowing how to control UAVs means greatly reducing the risk of human casualties in many airborne applications.

Real-world use of these algorithms in UAVs includes the surveillance of treacherous terrain or disaster zones, guiding an aircraft accurately and safely from city to city, or even helping a plane stabilize and land safely after it loses a portion of a wing.

TO SEE DEMONSTRATIONS OF THE QBALL IN ZHANG'S CLASS, VISIT *CONCORDIA.CA/NOW.*

THE IMPORTANCE OF GOOD CHEMISTRY

CONTINUED FROM P. 1

By mimicking the damage that occurs to DNA – via environmental factors or by chemotherapy – his goal is to determine how damaged DNA is repaired.

"Some chemotherapy works by damaging the cancer cell's DNA," he says. "Yet some patients become resistant to treatment because they have the capacity to reverse that damage. Thus the drug is no longer effective. If we understand how the DNA gets repaired, maybe we can come up with more effective drugs."

THE RIGHT CHEMISTRY

For most of these researchers, the chemistry bug bit early and hasn't let go. "I was drawn to chemistry early on. It was something that I understood and that made sense to me," says DeWolf.

"Because Concordia offers a co-op program, chemistry was something that became real, not just something that is done in a student lab and taught with textbooks," says Wilds, who earned his undergraduate degree here. "I learned theory in the classroom and then I would be experimenting on the bench, playing around with chemicals and learning new things. I really enjoyed it."

"I like chemistry because, in the end, I can actually make something – a compound that may find some use," says Capobianco.

"To gain an understanding and appreciate everything around us, we need to become more familiar with chemistry," concludes PhD candidate Naccache.

That goal has led Naccache on a 15-year chemistry journey: from CEGEP to undergraduate studies and working in industry to finally embarking on a research career. "I have never looked back."

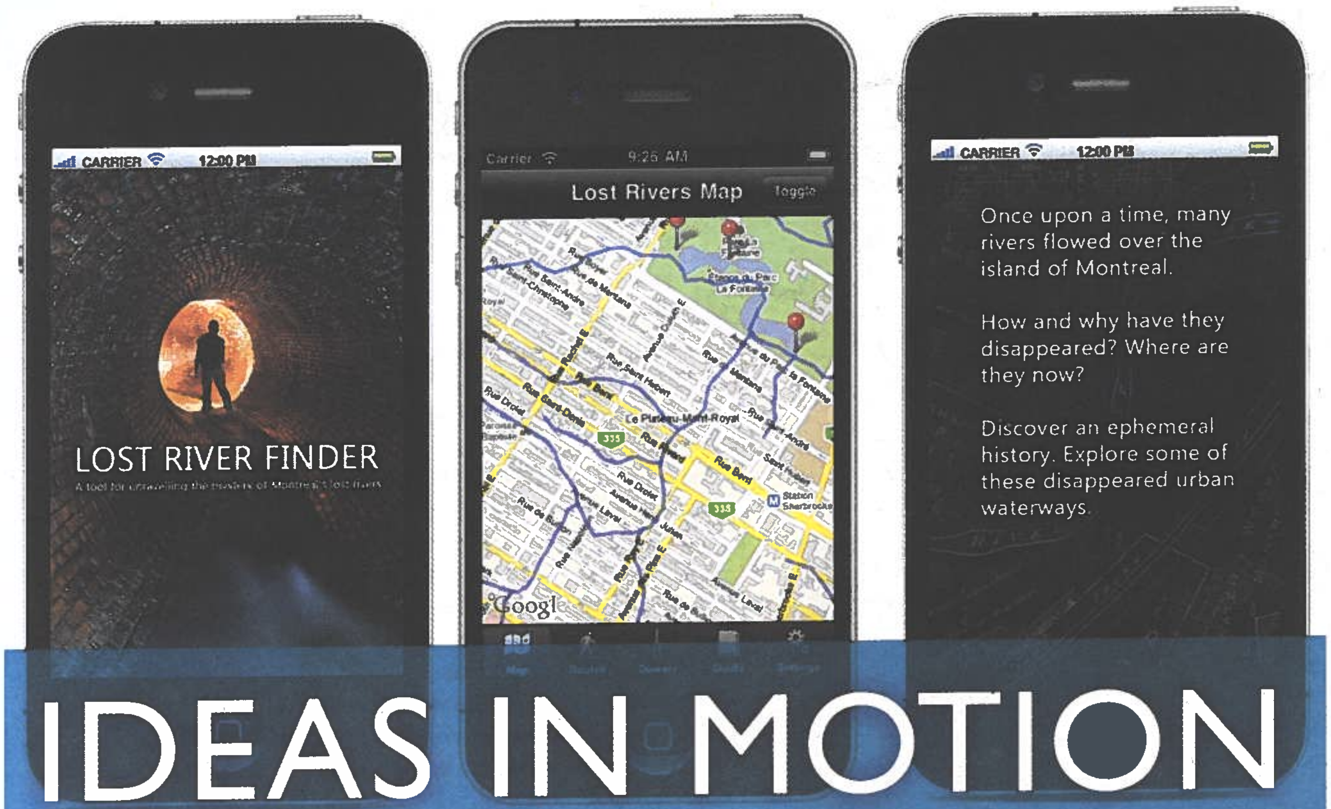
60+

COUNTRIES PARTICIPATING IN UNESCO'S INTERNATIONAL YEAR OF CHEMISTRY.

Pictured from left to right: John Capobianco, a Concordia University Research Chair in Nanoscience (Tier 1); Christine DeWolf, associate professor; Rafik Naccache, PhD candidate.
COURTESY DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

CONCORDIA'S CHEMISTRY AND BIOCHEMISTRY DEPARTMENT AFFILIATIONS:

- The Centre for Structural and Functional Genomics: *artsandscience.concordia.ca/biology/csfg/index.php*
- The Centre for Research in Molecular Modeling: *cermm.concordia.ca*
- The Centre for Biological Applications of Mass Spectrometry: *cbams.concordia.ca*
- The NanoScience Group: *nanoscience.concordia.ca*
- The BIOFINS platform for the study of biomolecular function, interactions and structure: *biofins.concordia.ca*



Once upon a time, many rivers flowed over the island of Montreal.

How and why have they disappeared? Where are they now?

Discover an ephemeral history. Explore some of these disappeared urban waterways.

IDEAS IN MOTION

Graduate communication studies seminar advancing research on mobile media

On March 9, professor Kim Sawchuk invited filmmaker Katarina Soukup (one of Sawchuk's former students) to discuss a project she's involved with called Under the City. The project details the hundreds of rivers under Montreal that were buried in the 1830s and '40s to accommodate development. Along with a documentary and website, the project will also release an iPhone app with a GPS-enabled map of subterranean rivers that still exist. | COURTESY KATARINA SOUKUP

Russ Cooper

Ask yourself: What items do you bring when you leave the house?

If you included your cellphone, you're not alone, says communication studies professor Kim Sawchuk.

"The cellphone, usually seen as the paradigm of the mobile media communications devices, has become this integral article for many people that keeps them in constant and perpetual connection, something that has become overwhelmingly important to many people in the last 10 years.

"As a result of mobile media, it's really difficult now to be nowhere or alone," she says.

Food for thought, isn't it? The 13 students in Sawchuk's graduate seminar course COMS 893J - Mobile Cultures, Wireless Communications think so as well.

67 OF EVERY 100 CANADIAN CITIZENS WERE CELLPHONE SUBSCRIBERS IN 2007.

The course is part of the joint PhD program in communications that welcomes students of varying disciplines from Concordia, Université du Québec à Montréal (UQAM) and Université de Montréal (UdeM). It tackles the question of mobility in general, and the cultural and connectivity discourses and practices therein.

"Thinking about things in terms of mobility emphasizes the way people and places are tied together in thin and often fragile networks of connections that stretch beyond an individual person or place," explains Sawchuk.

She's asking her students to develop research topics that reflect interests they had before the class, but require rethinking through the lens of mobility.

For example, UQAM master's student Melanie Millette was researching podcasting culture in Quebec for her media studies degree. But she's now revising her research to reflect how podcasts create a mobile listening practice and experience.

Along with fostering a critical understanding of the subject, Sawchuk is also hoping to help position her students as future leading researchers in the field.

"These students are at the forefront of this issue in Canada. Within social sciences and humanities, there's a return to considering the impact of various new technologies on how we experience everyday life," she says. "My intention is for them to bring their work not only to the class, but to always think about the wider public who needs to consider these questions in their workplaces and their everyday lives."

This year, the class has welcomed many guest speakers including Catherine Middleton, who is Canada Research Chair in Communication Technologies in the Information Society at Ryerson University; Mireia Fernández-Ardèvol from Open University, Barcelona; and Susan O'Donnell from the National Research Council Canada, who addressed the class by virtual conference. The last seminar of the academic year (April 6) will welcome Kok Siew Wai, lecturer at the Multimedia University in Malaysia.

The class's material also ties in nicely to the work Sawchuk is doing at Communication Studies' Mobile Media Lab. One of her latest research projects, Redressing Silences, Confronting Mobility: Seniors, Cell Phones and Aging, explores the adoption, rejection or adaptation of cellphones by senior citizens. The project is a collaboration with Barbara Crow from York University.

"As a researcher, the class allows me to not just foist upon the students my own narrow interests, but learn through their investigations. I treat the students as researchers," she says. "Through them, I have a broader vision and view of where my own particular research interests fit into a larger spectrum of the issue. I love teaching this class."

COMS 893J students will be presenting their final work at an upcoming as-yet-untitled conference about media and mobility, April 20 and 21 in the Hexagram Resource Room (Room EV-11.705) in the Engineering, Computer Science and Visual Arts Integrated Complex (1515 Ste. Catherine St. W.). The conference is open to the public, and will be attended by researchers from McGill, UdeM and Concordia.

LOUDER

The power of hip hop in

Russ Cooper

According to Yassin Alsalman and Marc Peters, hip hop's true significance lives beyond the words, beyond the hype, and deep in its culture.

As co-instructors of FFAR 398B - Hip Hop: Past/Present/Future, they feel the medium of hip hop is a way of gaining profound understanding of the world and society we live in.

AT EXACTLY WHICH POINT DO YOU START TO REALIZE, THAT LIFE WITHOUT KNOWLEDGE IS DEATH IN DISGUISE?

HIP HOP ARTIST TALIB KWELI

"Hip hop bleeds into so many different areas of life," says the Dubai-born Alsalman, a.k.a. Montreal-based MC The Narcicyst. "It's an amalgam culture spoken the world over that's created by a vast, diverse group of people from different backgrounds."

This, he says, creates the perfect condition to generate discussion about how hip hop's culture relates to pertinent issues: post-colonialism, Islam, the history of art,

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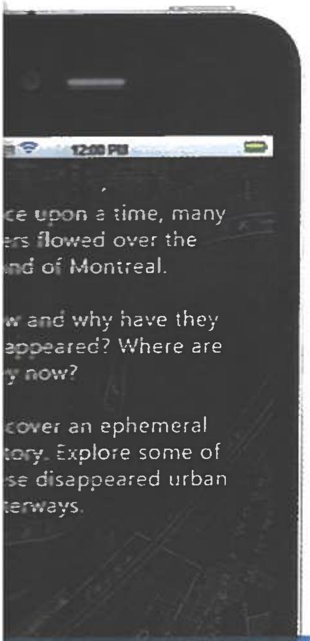
Concordia's 5 Days for the Hor



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LOUDER THAN A BOMB

The power of hip hop in today's world

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This, he says, creates the perfect condition to generate discussion about how hip hop's culture relates to pertinent issues: post-colonialism, Islam, the history of art, the ghetto, race, philosophy and religion, to name a few.

Marc Peters (left) and Yassin Alsalman.

Hip hop course looks beyond the h
BOTH PHOTOS COURTESY YASSIN ALSA

There are no tests, quizzes or exams. Instead, students "have to think and have to write … a lot," says Peters, a Concordia MFA graduate who started the course in fall 2009.

Along with a series of reading and informal writing exercises, students must write a 10-page paper about a subject of their choosing.

"It's an open-ended topic, but we want to stray away from the dichotomy of real and unreal hip hop. We don't want to have these regular rhetorical papers. We want people to relate the issues we speak about culturally within hip hop to anything in the world," says Alsalman.

This is the third semester that the overwhelmingly popular class, offered through the Faculty of Fine Arts
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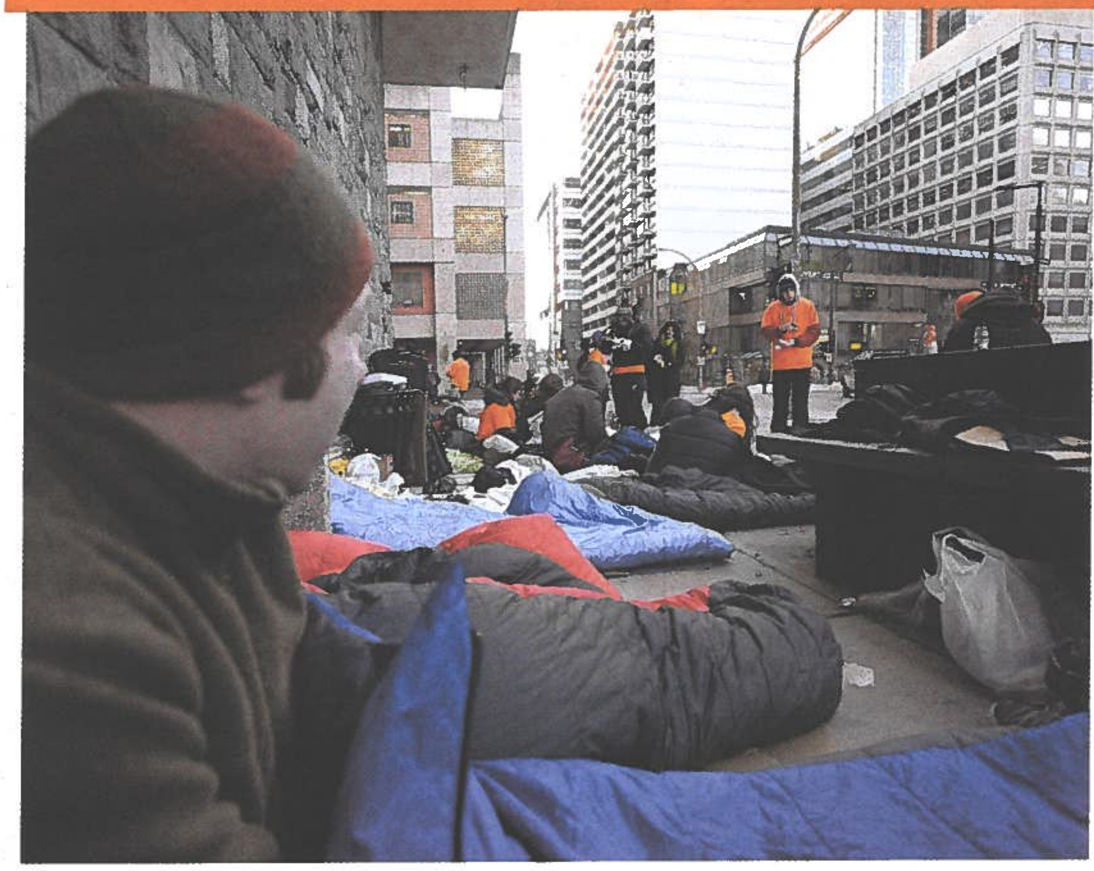
THROUGH RAIN, SLEET OR SNOW …

Concordia's 5 Days for the Homeless campaign digs deep



A few days of cold and rain didn't dampen the spirits of participants in the 5 Days for the Homeless fundraiser.

The annual campaign (March 13 to 18 this year) sees volunteers live "homeless" for five days to raise money and awareness for Dans la rue, a Montreal organization that helps those without homes.

This year's fundraising goal for Concordia is $35,000. At press time on Friday afternoon, the group had raised over $31,000.

Day one turned out to be the most successful first day of the initiative's four-year history at Concordia, raising $4,500. Day two bested that figure, raising $5,000.

"It's been a long five days, but the help and the support from the community have been monumental," says 5 Days organizer Josh Redler.

Although the on-the-street fundraiser is over, donations can still be made at *www.tinyurl.com/5daysconcordia.*

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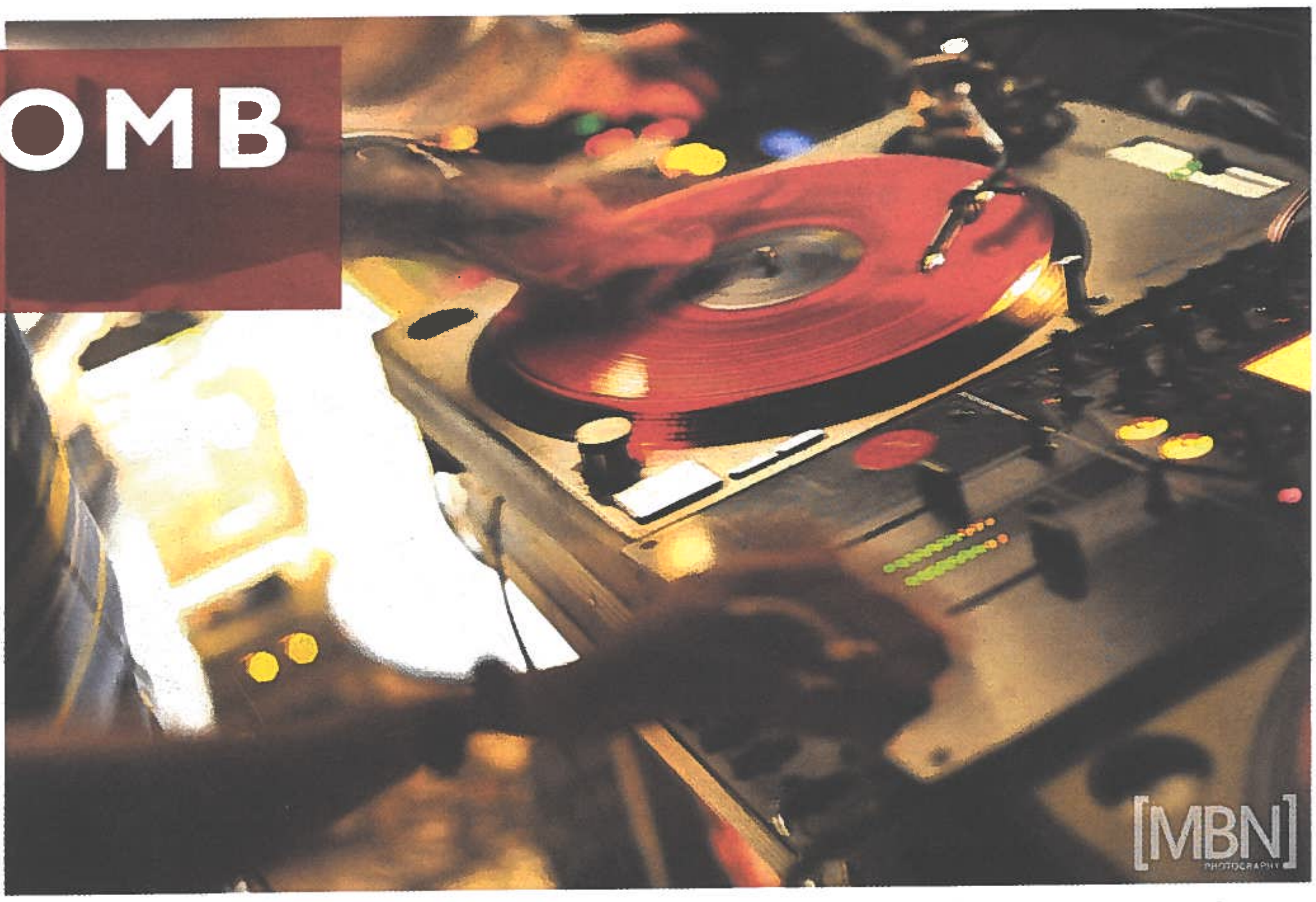

Hip hop course looks beyond the hype to the political and social meaning of the music and its message.

BOTH PHOTOS COURTESY YASSIN ALSALMAN

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his is the third semester that the overwhelmingly ular class, offered through the Faculty of Fine Arts for students in other Faculties, has been taught. This winter, the class's capacity of 90 students filled up within 10 days of being listed.

It's also the first time Alsalman has taught alongside Peters for the full term. Peters, a non-musician who has listened to hip hop for most of his life, recruited Alsalman, a passionate politically motivated hip hop artist, to speak to the class in fall 2009 after having been a long-time fan. "In fact, our friendship is predicated on this course," says Peters. "Hip hop has affected us both in similar ways."

When approached about the possibility, Alsalman was keen on the idea, having considered proposing a similar class as he was completing his master's in media studies at Concordia in 2006. Alsalman's thesis about how hip hop has helped young Arabs express themselves in the last decade of political turmoil will soon be released as a book, *The Diatribes of a Dying Tribe.*

The pair agrees that a class with "hip hop" in its title will inevitably be popular, and they've seen many students think it'll be a bird course. Wrong, they say.

"The assumption is that it is just a surface thing. It's not," says Alsalman. "It's about critical thinking and being aware of the layers of everything in society, to become analytical about everything. Instead of accepting social norms, we want the students to find out why they've become social norms."

FOR MORE ON THE NARCICYST, INCLUDING THE VIDEO FOR THE TRACK *P.H.A.T.W.A.*, SHOT ALMOST ENTIRELY IN THE ENGINEERING, COMPUTER SCIENCE AND VISUAL ARTS INTEGRATED COMPLEX, VISIT *WWW.IRAQISTHEBOMB.COM.*

SLEET OR SNOW …

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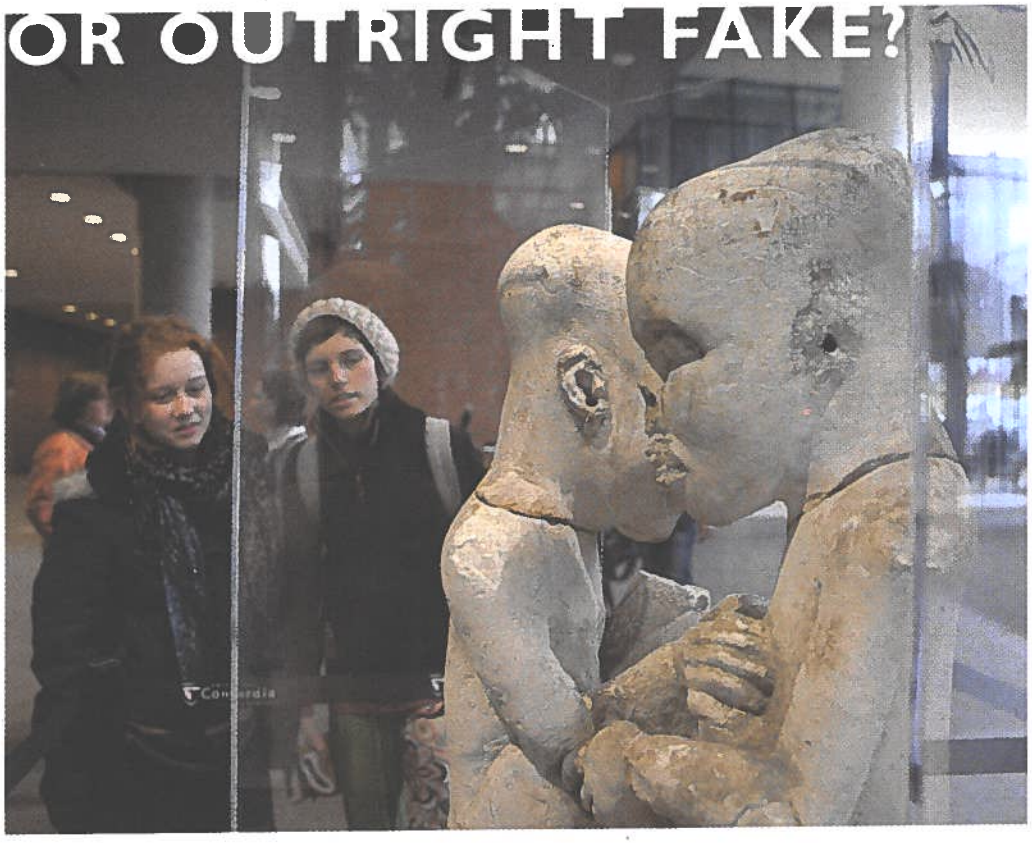
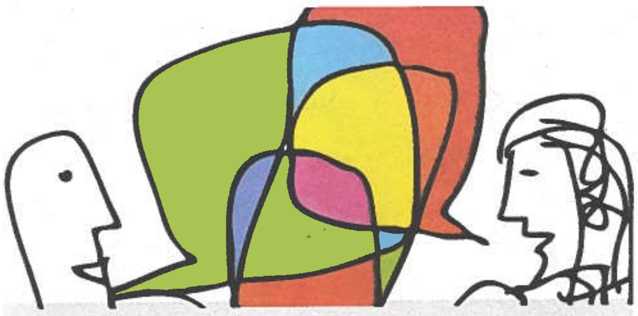
RARE ANTIQUITY OR OUTRIGHT FAKE?



Concordians and the general public got a special peek at a mysterious limestone sculpture in the Atrium of the EV Building from March 16 to 18. Once part of the Diniacopoulos Collection of Mediterranean antiquities, the work has been in the possession of the university since 1999 and had remained in a crate for decades. Called *The Starving of Saqqara*, the sculpture was displayed for the first time to obtain insight into its origins, since no authority has been able to confirm its pedigree. The enigmatic work can still be viewed at *concordia.ca/diniacopoulos.* | CONCORDIA UNIVERSITY

WHAT'S **ON**

PILOT COURSE-EVALUATION PROJECT



A working group led by Vice-Provost Teaching and Learning Ollivier Dyens has been examining the issue of course evaluations at Concordia. The group proposes using a form developed by the non-profit IDEA Center at Kansas State University.

Dyens is aware that some faculty members are concerned about the proposed tool because of the direct effect course evaluations have on a professor's career. To address these concerns, Dyens invited **Steve Benton, Senior Research Officer at the IDEA Center**, to address the Concordia community and field questions.

The first session will be held on the Loyola Campus on Thursday, **March 24 from 2:30 to 4:30 p.m. in Room CC-112**, Central Building (7141 Sherbrooke St. W.). The second session will be held the following day on the Sir George Williams Campus, Friday, **March 25 from noon to 2 p.m. in Room MB-1.437**, John Molson Building (1450 Guy St.).

Open to Question is a series of lunchtime exchanges organized by University Communications Services on topics that matter to Concordians. The most recent topic was the draft academic plan, presented by Provost David Graham.

You can hear previous conversations at: *www.tinyurl.com/O2Qpodcasts*.

CONCORDIA HOSTS SCIENCE FAIR

For the second consecutive year, Concordia is hosting Expo-sciences, the Hydro-Québec **Montreal Regional Science Fair**.

From **March 27 to 29**, more than 40 schools from Montreal, Laval, Lanaudière, the Montérégie and the Laurentides are expected to take part in this exciting event across the Sir George Williams Campus. About 300 students from Secondary 1 to Secondary 5 and CEGEP levels will present exhibitions in the design and experiment categories. From among these, 12 winning projects will be selected to move on to the Super Expo-sciences Quebec Final. Also, the three top projects will move on to the Intel International Science and Engineering Fair that is taking place May 2011 in Los Angeles.

More information, including the schedule of events, is found on the Concordia *NOW* site: *www.concordia.ca/now/upcoming-events/exposcience*.

CAPSTONE POSTER PRESENTATIONS

Every year, final-year **Engineering and Computer Science** (ENCS) undergraduates showcase their work. Over two days, the students present posters to explain their capstone projects, which require the use of material learned over the course of their degree. These exercises enable students to carry out a team design project from scratch, experience project management, and practice their technical writing and presentation skills.

On the first day, **March 31 from 1:30 to 4:30 p.m. and from 6 to 9 p.m.**, the 23 projects from the Department of Mechanical and Industrial Engineering and five from Computer Science and Software Engineering will be presented. The following day, **April 1**, the 18 projects from Electrical and Computer Engineering and 26 in Building, Civil and Environmental Engineering will be presented from **1:30 to 4:30 p.m. and from 6 to 9 p.m.**

Come see what Concordia's engineering students have learned during their studies.

More information will be posted on the ENCS website: *www.encs.concordia.ca*.

GRADUATE STUDENT RECRUITMENT RAMPS UP

More funds available for study and professional opportunities

KAREN **HERLAND**

Concordia has recently announced significant improvements in allocating funds to graduate students. The measures are part of an effort to improve the university's research and advanced training profile.

"We were seriously lacking competitive funding packages for graduate students," acknowledges Graham Carr, Dean of Graduate Studies. He is confident that newly announced programs will change that.

New funds have been made available, including the recently announced $3 million to be offered over the next three years as multi-year tuition waivers for promising international graduate students.

"This will allow us to double the number of students we can offer tuition waivers to," explains Carr. Currently, Quebec's Ministère de l'Éducation, du Loisir et du Sport provides funds for 30 to 35 international students.

That change in the university's budget was approved by Fred Lowy hours after he took up his duties as Concordia's President in January. "It's a signal from the top that there is significant support for graduate studies," says Carr.

6,670 GRADUATE STUDENTS REGISTERED FOR THE ACADEMIC YEAR 2009-10.

Louise Dandurand, Vice-President Research and Graduate Studies, emphasizes this commitment: "It is essential for our university to attract top level graduate students, and we are badly in need of putting in place competitive measures in this regard."

The new funding is being offered in tandem with new ways of allocating funds already available. "Part of the whole strategy is to take the money we have and use it in a better way in terms of recruitment and retention," explains Carr. For instance, changes to the graduate fee billing structure introduced last year represented significant savings for the university, which have been translated into 60 one-time $10,000 awards for graduate students, both new and returning.

Carr credits the university's Chief Financial Officer Patrick Kelley for his commitment to increasing funds available for graduate students. This builds on past initiatives such as the Special Entrance Awards for newly recruited external fellowship holders.

Another significant change is that some funds are now being made available earlier, at the departmental level. Carr says that in the past, funds allocated to potential graduate students were not determined until March. By then, students who had applied in the fall might have already decided to go elsewhere, where funding was more readily available. With departments empowered to offer a limited number of awards up front, top students can be recruited more efficiently.

Retention is also a consideration. To that end, funds that were primarily available for PhD students and post-doctoral fellows to present their research at refereed conferences or juried expositions have been expanded and are now available through competition to all qualified graduate students. Similarly, funds have been increased for students who are making rapid progress through their graduate degrees to accelerate completion of their theses, dissertations and major research projects.

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GOOD VIBRATIONS?

Subhash Rakheja studies how to reduce impact of everything from bus seats to power tools

Engineering professor Subhash Rakheja shows off the anti-vibration glove he's testing in his lab. | CONCORDIA UNIVERSITY

SYLVAIN-JACQUES **DESJARDINS**

Anyone who's ever used an electric or gas lawnmower knows how pushing the device can cause tingling hands. This is caused by motor vibrations and comes with the turf for people who cut grass for a living.

Workers who employ handheld power tools in the mining, forestry, manufacturing and services sectors can also be exposed to large levels of vibrations in their hands and upper arms. Such vibrations are not without consequence.

"Prolonged exposure to intensive tool vibration can cause hand-arm vibration syndrome," says Subhash Rakheja, a professor in Concordia's Department of Mechanical and Industrial Engineering. "Over time, some workers can lose sensation in their hands or lose dexterity, they can no longer distinguish between hot or cold surfaces or they can experience discolouration in the extremities of their fingers, known as Raynaud's phenomenon."

The study of tool- and trade-related vibrations is relatively new in North America though it has been a subject of concern in Europe. As a member of the Concordia Centre for Advanced Vehicle Engineering, Rakheja has published widely on the ills of vibration overexposure.

He has completed extensive research on how to minimize vibrations that rattle the seats bus drivers must sit on for long periods, over their career. His most recent study on soil compactors, staples of construction sites, found that exposure to vibrations could be reduced by a whopping 60% through a simple seat upgrade.

Rakheja routinely collaborates with an interdisciplinary research network on workplace health. His expertise led the U.S. Centers for Disease Control and Prevention to employ him as an advisor for its West Virginia research site. In Quebec, he works with the Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST).

He's worked extensively with the IRSST's Paul-Émile Bouleau and Pierre Marcotte to develop best workplace practices, which led to ISO (International Organization for Standardization) standards for whole body vibration (ISO 5982) and for hand-arm vibration (ISO 10068). They are now investigating a world standard for anti-vibration gloves.

Rakheja is also examining how to reduce the impact of industrial power tools, such as jackhammers used in the mining industry, which can lead to vascular and skeletal disorders. "The most risky tool to use for workers is the jackhammer," he says. "It's like a loaded gun."

Solutions do exist, he says, and can be as simple as equipping workers with the appropriate anti-vibration gloves. "The goal is to cushion the hand from repeated exposure, but how do you measure if that glove is good?" he asks.

The answer may come from the 16 graduate students he's supervising. For instance, Kabir Krishnan has devised an instrument to simulate the effects of power tools and hopes to develop cost-effective vibration sensors, while Arman Shahmir is working towards a measurement system to assess how people react to vibrations when seated in vehicles.

THE BIGGEST CHALLENGE IS TO CONVINCE INDUSTRY TO INVEST IN WORKER SAFETY BEYOND WHAT'S LEGISLATED.

SUBHASH RAKHEJA

"We can simulate any tool vibration in our lab, but how tools are actually used in the field can differ considerably," says Rakheja. "Everyone pushes at different strengths and speeds."

That's why human tests remain critical, he says, noting simulation mannequins are not always ideal. "The human body adapts, while a test dummy remains stiff," he says.

While prevention remains the best medicine, Rakheja says workers are often asked to go beyond their capacity in the name of productivity. "We live in a society where everything must go faster," he says. "But when we make things go too fast, we forget about the slow poison."

"The biggest challenge is to convince industry to invest in worker safety beyond what's legislated."

MORE THAN "JUST SAY NO"

Concordia students help elementary school children make healthy choices

BEVERLY **AKERMAN**

Concordia's Department of Applied Human Sciences (AHSC) has teamed up with the English Montreal School Board (EMSB) to launch Kids Can! – a program to encourage children to steer clear of drugs.

The project was developed with Agence Ometz, a local counselling and support centre.

Health Canada is providing nearly $400,000 to fund the project as part of their drug education program, explains Lisa Ostiguy, Chair of AHSC.

3,000 STUDENTS WILL BE INVOLVED WITH KIDS CAN! BY 2013.

A pilot program was launched at three Montreal-area schools in mid-February, with 20 AHSC students involved for the six-session duration, says Ostiguy. The plan is to gradually broaden the program, adding three schools in March and up to 15 more each year for the next two school years. By the conclusion of the project in 2013, approximately 3,000 elementary school students may be involved.

The Grade 5 and/or 6 students will explore facts about drugs and their use and will learn strategies to help them cope with peer pressure, empowering the youngsters to make healthy decisions in their own best interests. Parents and teachers will also be provided with information and resources to help reinforce the lessons of the program, which is highly interactive, covering behaviour and the influence of peers. It relies on role playing and is designed to be fun and engaging as well as informative.

Clinical Director Barbara Victor of Agence Ometz spearheaded the development of Kids Can!, approaching Health Canada and recruiting Varda Mann-Feder, another AHSC professor who is currently on sabbatical. Ostiguy explains, "We got involved while the grant was being written, providing letters of support and recruiting some of our students to work as volunteers in the schools, delivering the program to the children." During this pilot year, the program will be delivered by the AHSC students on a completely voluntary basis but next year, says Ostiguy, "a special topics course is being designed to teach our students youth facilitation skills and train them to deliver the program. They will still be volunteering when they're in the EMSB schools, but their training will be for university credit."

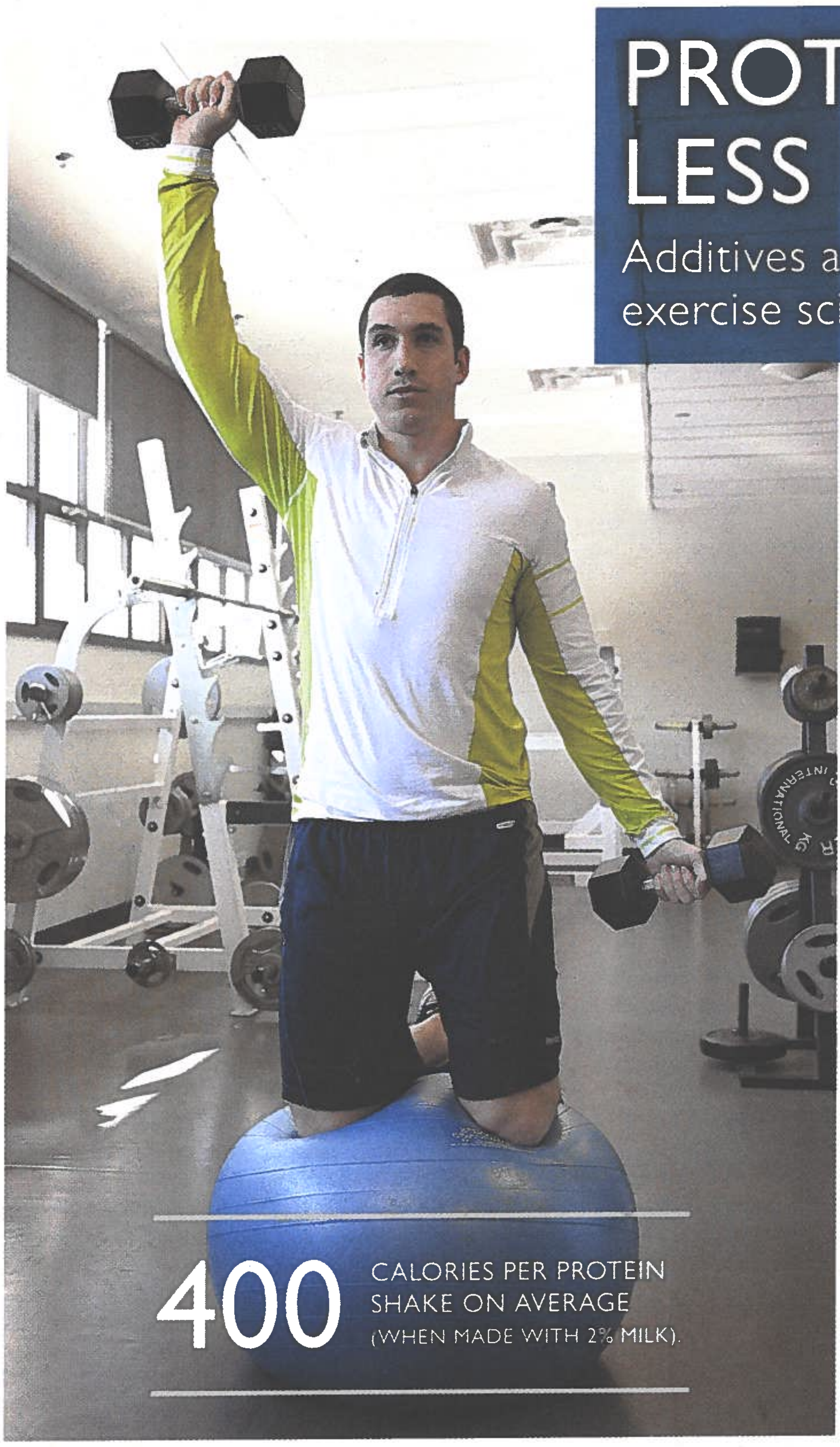
Cathrine Rambech (left) is participating in the Kids Can! program under the direction of Lisa Ostiguy, Chair of the Department of Applied Human Sciences. | CONCORDIA UNIVERSITY

Program evaluation will be performed to assess goals and outcomes, supervised by student Jessica Bernstein through Concordia's John Molson School of Business MBA Program. A focus group of parents will also provide feedback and another view of the curriculum.

Ostiguy says AHSC students will benefit greatly from working in the classroom with EMSB teachers. "It's a perfect win-win for us – a great opportunity for our students to get involved in a federally funded program, to learn about research, and to deliver a wonderful program for which there is a need."

PROTEIN SUPPLEMENTS: LESS IS MORE

Additives are unnecessary for most athletes, says exercise science instructor Mark Cesari



400 CALORIES PER PROTEIN SHAKE ON AVERAGE (WHEN MADE WITH 2% MILK).

Mark Cesari, of the Department of Exercise Science, says only athletes in training need protein supplements. | CONCORDIA UNIVERSITY

SYLVAIN-JACQUES
DESJARDINS

Protein supplements – served up in shakes or bars and derived from whey, soy, egg and casein – are gaining popularity among exercise enthusiasts.

Young men keen on bulging up their biceps, as well as young women looking to add muscle definition, are increasingly targeted by supplement companies. Protein additives are even marketed as healthy meal replacements.

Yet Western diets – rich in fish, meats, eggs, dairy products, grains and legumes – contain enough protein for most people to eschew supplements.

"Extra protein is unnecessary for weekend warriors or the general population, but can be useful for college, professional or Olympic athletes," says Mark Cesari, an instructor at Concordia's Department of Exercise Science.

An accredited strength and conditioning specialist, Cesari helped train the Stingers during his undergraduate degree at Concordia (BSc Exercise Science '04). Since obtaining his master of science from the Arizona School of Health Sciences, he's trained hockey players from the Phoenix Roadrunners, as well as forwards Brian Gionta of the Montreal Canadiens and Ryan Callahan of the New York Rangers.

Whether athletes are professional or amateur, their total caloric intake should not contain more than 30% protein. "Otherwise, you build up what are called toxic ketones, which make kidneys work in overdrive," Cesari warns. "You end up urinating any extra protein consumed."

Recent studies have confirmed that a protein-heavy diet can overwork kidneys. What's more, protein supplements have been shown to inflame the esophagus and stomach lining as well as foster bloating or diarrhea. Indeed, the American Academy of Pediatrics reports the majority of children and adults consume more protein than needed.

That's why athletes need to proceed with caution when mixing in supplements. "We still don't know much about protein powders, since these products remain unregulated by Health Canada," observes Cesari. They are also unregulated by the U.S. Food and Drug Administration.

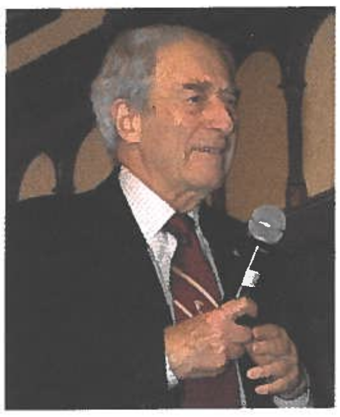
Protein additives also contribute to water retention. "Men who use protein to gain muscle mass deflate like a balloon the minute they stop consuming these supplements," Cesari says.

At an average 400 calories per protein shake (when made with 2% milk) such drinks can be fattening. "Men who consume protein supplements to gain muscle mass, for instance, tend to grow bellies," Cesari says. "A person must burn off 500 calories each day, for a week, to lose one pound."

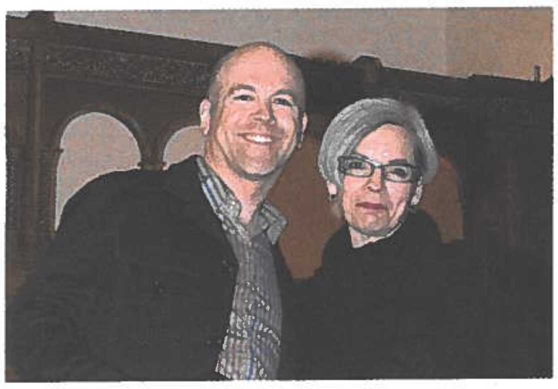
To anyone who wishes to build muscle mass, Cesari recommends they hire an accredited professional to create a targeted program to meet their goals rather than drinking protein to get bigger.

WE ARE THE CHAMPIONS

Sustainable Concordia fetes staff, faculty and students who have made a difference



President Fred Lowy addressed several dozen guests who braved a snowstorm to attend the second annual Sustainability Champions gala held March 9 in the Loyola Chapel. | CONCORDIA UNIVERSITY



Martin Racine, who is a professor in the Department of Design and Computation Arts and founding member of Hexagram, received his award from Rhona Richman Kenneally, Chair of his department. She acknowledged Racine's commitment to integrating sustainability principles into his teaching and research practice and assignments for many years. | CONCORDIA UNIVERSITY

The organizing committee for the gala showed off their jazz hands to celebrate a job well done. Front row (from left): Chantal Forgues (who emceed the event), Alex Oster, Mariam Masud. Back row: Vanessa Strzelecki, Chad Walcott, Linton Garner, Laura Beach, Faisal Shennib, Shelly Elsliger (crouching), Pawel Porowski, Erle Lamothe. | CONCORDIA UNIVERSITY